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~~31 May~~ 1968

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MEMORANDUM FOR THE RECORD

SUBJECT: Program Plan for Follow-On Image Forming
Reconnaissance System

25X1 REFS : (a) [] dated November 9, 1967 - NRO Memo
to EXCOM - "FY-1969 Budget and Budget Issues
for the NRP and the Status of Program Funding
FY-1968.

25X1 (b) [] - FY-1969 Budget Issue No. 9 -
Advanced Aircraft

1. The DNRO's recommended NRP budget for FY-1969 was submitted for approval to the EXCOM, reference (a), with the specific exclusion of any effort for Advanced Aircraft R&D.

In Reference (a), the members of the Executive Committee were invited to identify any additional issues for discussion. Reference (b) was subsequently prepared.

2. In reference (b), it is pointed out that the decision to phase-out the OXCART vehicle this year and the decision to discontinue work on the ISINGLASS Concept represented a trend away from continuing maintenance of a high-performance covert manned overflight capability in the NRP. It is also noted that the requirement for intelligence which necessitates such a vehicle must be confirmed, and the cost and effectiveness of alternative vehicular concepts examined: for example, should the vehicle be manned or unmanned (drone) and in each case what type of launch operation, propulsion, recovery, etc. offers the most promise. Finally the reference suggests that these concepts

must also be compared with single-pass recover^{b1}age orbital satellite vehicles. Subsequently, the FY-69 President's Budget was released which included as a General R&D effort [] for a concept study to explore various methods of achieving a survivable quick reaction reconnaissance capability (manned or unmanned) for the projected Soviet Bloc and other defensive environments through the 1975-80 time period. 25X1

3. This office therefore proposes to contract for a study, the goal of which will be to arrive at various preliminary design concepts for performing an airborne hi-resolution image forming reconnaissance collection function and comply with the requirements of survivability and quick-reaction within the prescribed environment. A minimum of constraints will be imposed on the contractors to insure original and imaginative thinking. Specific direction will be given to pursue the manned vs. unmanned options as well as investigating the self-accelerator vs. air launched possibility. Although an image forming sensor is a requirement, only broad estimates of weight and volume will be considered so as not to limit vehicle regions of operation initially. Obviously specific sensor capability and requirements should be considered almost concurrently but separately from subject study. Sensor interface would be considered in any follow-on effort. Guidance will be solicited from the DD/S&T and perhaps from another high ranking consultant such as [] Information 25X1 from previous efforts will be provided the study contractor such as OXCART, ISINGLASS, [] 25X1 concept, and various drone concepts.

4. Consideration must be given to the contractor options.

There is some merit in dealing just with a "think group" having no vested interest in hardware. On the other hand, most major airframe manufacturers have, as part of their organization, advanced concept groups which not only perform the functions of a "think group" but have the added advantage of practical inputs from the various engineering and manufacturing components. As an approach to the study which would be in four segments, it is proposed to select one airframe manufacturer to be designated as the overall study program manager. The contribution of a "think group", such as IDA or RAND, or etc., would be provided to the overall manager and would be confined to two segments; definition to the problem with emphasis on the geo-political considerations and to the analysis. Threat definition and operational expertise would be furnished by OSI and OSA respectively.

5. The task is envisioned to consist of these four major segments i.e., definition of the problem, potential solutions, analysis of the potential solutions and final selection or selections with appropriate sub-segments as outlined below:

I. PROBLEM

- a. Threat
- b. Scenario
- c. Sensor Perf
- d. Mission Reqmts

II. POTENTIAL SOLUTIONS/CANDIDATE CONCEPTS

- a. Flt Modes
- b. Technology
- c. Operational Considerations

III. ANALYSIS

- a. Force Fit
- b. Reaction
- c. Man Value

IV. ANSWER

Amplification and interpretation of the above outline is as follows:

- I. Problem - Utilizing available appropriate inputs, define the environment within which the system must survive and the end product the system must be capable of providing.
 - a. Threat - These data, to be provided by OSI, would ideally define the lethal (speed - altitude - radar cross section) envelope of the defenses projected to 1975-1980.
 - b. Scenario - Both soviet bloc and non-soviet bloc areas of interest would be considered for potential targets for collection. The geo-political posture of the remaining land masses would then be considered in defining the range requirements of the system. The "Think Group" would provide a major contribution in this area.
 - c. Sensor Performance - Broad specifications for the sensor will be considered to allow an approximate weight and volume allotment in the vehicle. However, it is not intended to include any detailed sensor design within the scope of this initial study. Nor is it intended to initially compromise the vehicle ~~profile~~ profile because of projected sensor limitations, such as, minimum altitude.

- d. Mission requirements - Consideration must be given to retrieving the data once on-board the aircraft. In consonance with the quick-reaction requirement, the data could possibly be transmitted via a data link if the quality of the product is not prohibitively degraded and if the complexities of the on-board equipment can be accepted. If, on the other hand, the take is to be returned to a ground base, the base could be within or outside of the ZI.

II. Potential Solutions/Candidate Concepts - The proposed investigative study should ideally result in one or more concepts/configurations to ~~solve~~ solve the problem outlined in Item I above. This segment would be the sole responsibility of the airframe contractor under Headquarters direction.

- a. Flight Modes - All modes will be examined to determine if one or more emerges as a superior approach. The launch phase will include investigating vehicles which are air launched, ground launched, boosted or self-accelerators. The significant, i.e., intelligence gathering phase, will consider but not be restricted to glide, powered, throttling techniques, high-altitude, low altitude and combinations thereof and speeds to encompass from hypersonic to sub-sonic.

- b. Technology - The contractor will avail himself of the latest materials, manufacturing and engineering technology. All of the technology derived from previous programs will be considered so as not to "replow old ground." The most futuristic NASA data will be considered for applicability.
- c. Operational considerations - The case of manned vs. unmanned will be considered in depth with all compromises both from the vehicle design standpoint and from the cost and reliability standpoint being weighed. The type of launch and the basing facilities will be reviewed as they effect the design capability. Considerations necessary to maintain a covert program will be addressed.

standpoint and from the cost and reliability standpoint being weighed. The type of ~~launch~~ launch and the basing facilities will be reviewed as they effect the design capability. Considerations necessary to maintain a covert program will be addressed.

III. Analysis - A determination/assessment of how well each concept meets the problem will result from this phase of the task.

- a. Force fit - It is highly unlikely that any one design will prove superior in all aspects and certain weight will have to be given to the various aspects of the problem during the analysis.
- b. Reaction - Any intelligence collection system is useful only if the data are available to the users on a "soonest" basis. Therefore, the quick reaction ability of the concepts will be given prime consideration. Both the reaction time for the actual collection of the data and also the subsequent steps necessary for processing, interpretation, etc., will be a part of the study.
- c. Man Value - Since politically an unmanned vehicle would be much more palatable, the presence of a man must prove to be of extreme value from the reliability and mission success

be present only during the test phase with the vehicle being droned operationally.

- d. Cost - Naturally any large expenditure of funds committed for intelligence collection can only be justified if (a) a requirement for the intelligence exists, (b) the concept has a high chance of success of obtaining the data and (c) a more reliable, less costly, more politically acceptable approach doesn't exist.) Therefore, in the analysis, it is envisioned that both the "think group" and headquarters will have an input.

IV. Answer - This phase of the ^{task} ~~task~~ represents the end result of the effort. The candidate concepts will be cited with the supporting rationale for their selection.